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CONCHOLOGY.

NO. I.

The term Conchology is derived from the Latin *concha*, a shell or shell fish, and Greek *logos*, discourse, and comprehends that branch of natural history which treats of shells, distributes them into genera and species, and describes the character and economy of the animals which inhabit them.

To some, the examination of this department of science has appeared useless, and unworthy to occupy the time and talent of an informed mind. Reasoning with persons of this description, is seldom attended with any good effect. Ignorant of the advantages which have resulted to mankind from an intimate acquaintance with natural objects, they overlook the steps by which they have been gained: and likewise seem to forget, that the examination of those objects which an all-perfect Being has created, can never be degrading to man, who was sent into this world in order to examine, admire and adore.

Besides, if we attend to the variety of forms which shells exhibit, and to the richness of their coloring, we will not be surprised that they have obtained a conspicuous place in public collections, and have attracted the notice of the curious observer. But to view shells merely as objects of beauty, without attending to the animals of which they only form a part, would be to overlook by far the most important branch of the science; and, like the florist, to take notice of color and shape, and neglect to attend to those functions which, while they excite our astonishment, exhibit marks of design. The examination of the contained inhabitants, enlarges our knowledge of the laws of animal life, and teaches us that each shell, however insignificant it may seem to be, possesses

faculties suited to the supply of its wants, and to the situation which it is destined to occupy. Or in the more harmonious periods of the poet, we would say,

> 'Each shell, each crawling insect holds a rank
> Important, in the plan of Him who framed
> This scale of beings.'

But we are not disposed to rest the claims of the science of conchology to public favor, altogether on the grounds which we have now stated. As objects of utility to man, shells deserve our notice. Many species supply his table with agreeable and nutritious dishes; others form most enticing baits for catching fishes, or furnish materials for the manufacture of different kinds of dress. The pearl is prized as an ornament, and the Tyrian purple is deservedly held in estimation.

We must view shells likewise as the enemies of man, and entitled to his consideration. Some are deleterious to his constitution, while others defeat his plans. The barnacle, by adhering to the bottoms of ships, impedes their motion; and the teredo pierces their planks and destroys them.

When these circumstances are duly considered, the science of conchology will appear of importance, as it unfolds the history of objects of beauty, curiosity and utility.

Of late years, the study of conchology has been pursued with eagerness by the most eminent naturalists. Under these auspices, the science has assumed a consistent and regular form. And the *Boudoir* of the accomplished female would be considered as unfurnished, were it not decorated with these favorite objects of admiration. Indeed, in this respect, mankind have discovered no small degree of folly and extravagance, in the high price which has been given for rare and beautiful shells, and often only on account of their rarity.

The few scattered fragments concerning the natural history of shells, or testaceous animals, which are to be found in the writings of the ancients, when compared with the more extended and systematic labors of the moderns, are so unimportant and inaccurate, that it would be altogether superfluous to trouble our readers with an account of the information which they contain. It appears however from the works of Aristotle and Pliny, the great naturalists of Greece and Rome, that the study of conchology was not entirely neglected in their time. It appears, too, that admirers and collectors of shells were not then wanting. Scipio and Lælius, we are informed, found a relaxation from the toils and care of war and government, by indulging in this elegant amusement.

Nor will it be attended with much advantage, to give a particular account of the works of the earlier writers on this subject among the moderns. These are Gesner, Johnston, Rondeletius, Aldrovandus, Bellonius, Wormius, and some other authors, who cultivated this department of natural history, and accompanied their descriptions with figures, illustrative of the objects which they described. The first author who attempted a systematic division of shells, according to their external form and character, was John Daniel Major, professor of medicine in the university of Kiel in Holstein. His method is published at the end of his curious and interesting remarks on the treatise concerning the *purpura* of Fabius Columna, printed at Kiel in 1675. The system of the German naturalists was followed by that of Dr. Lister of England, on a more extended and improved plan, which was published ten years after. Succeeding naturalists turned their attention to the study of conchology, and to the improvement of the classification of the numerous objects of this department of natural history. Such were Buonanni, Rumsius, Langius, Breynius, Tournefort, Gaultieri, D'Argenville, Klein, Linnæus, Adanson, Geoffroy, Muller, La Marck, De Blainville, Schumacher and Cuvier.

To exhibit all the systems of these authors would require volumes, and therefore cannot be expected in the limited space which our pages are destined to occupy. Our only object is at present to give such a view of the subject as will tend to facilitate our progress in the study of conchology. We shall here treat of the general terms which are employed in describing shells, and the names by which the different parts have been distinguished by naturalists. This, we trust, will not be unacceptable to our readers, particularly those to whom works on this subject are inaccessible without imposing upon them a greater expense than they can afford, or of which they may deem the subject worthy.

All shells or testaceous bodies hitherto discovered, may be divided into three principal tribes, and which, after the Linnæan manner, may be denominated *Multivalve, Bivalve* and *Univalve.*

An external part of a shell being of a testaceous substance, and either itself forming a shield or covering for the animal, as in univalves, or in union with another, or others connected by a ligament, cartilage, hinge, teeth, or other fastening, is denominated a valve. The shells, therefore, consisting of a single piece, are called univalves, those of two parts bivalves, and those of many parts multivalves. Between bivalve and

multivalve no distinction is drawn; shells consisting of more than two such parts, being called multivalve, without any regard to number. An amendment is proposed by some of the French writers, in a new order under the name of trivalve.

Shells of the simplest form are arranged by some naturalists in the first class, from which they proceed progressively to those possessing the greatest number of valves, and being of the most intricate structure. This is an ancient and very simple mode of arrangement, and has its advocates in the present day. Linnæus reverses this order by beginning with multivalve shells, which are of the most complex structure, and ending with those of the simplest form. We cannot avoid thinking the former preferable, and shall adopt it in the present instance.

Explanation of the Parts of Shells.

Univalves. In the examination of a shell of this order, the contour or outline is the first thing to be regarded. By this the conchologist is guided in his deffinition of simple, spiral, or turbinated shells; discoid, flattened, or turrited shells; those with smooth or uneven *anfractus;* the ventricose, alated, labiated, rostrated, and many other distinctions, all which strike the eye at the first view. It is indeed, by attending to the contour, that the principal distinctions in shells of this kind are at once perceived, taking into consideration the back and front profile at the same time.

Next to the profile of the shell, the structure of the mouth, the pillar, and expansion of the inner lip, the gutter or canaliculation, and the umbilical opening, and operculum if any, are to be considered, and lastly, the work on the outer surface, as well as the colors with which it is embellished.

The base or bottom of the shell we consider that part upon which it rests when supported in an erect position, with the summit or tip of the spire standing vertically. In such shells the tip is called the apex. The course of the spires or wreaths is from the left to right in most spiral shells. When speaking of the right and left sides of a shell, it should be understood as having the aperture downwards, and it will then be seen that in most shells the aperture or opening is on the left side, that is, facing the right hand of the spectator.

Base, the tip of the salient end of the shell, at the extremity opposite the apex of the spire; in the rostrated kind of univalves it implies the tip of the beak. Some say the shell rests on its base when laid upon a flat surface with the mouth downwards; this is not correct, except in the patella tribe,

and some other univalves which have no regular spire. The base of a shell is denoted in plate iii. fig. 1, by *a*.

Apex, the summit of the shell, *b*.

Front, the face of the shell, with the aperture placed directly in front of the observer, *c*.

Back, that part of the shell which is immediately opposite to the preceding.

Sides, those parts seen longitudinally in profile, to the right and left when the shell is viewed either in a front or back position, *d*.

Body of the shell, (*corpus*) the first whorl of the spire at the base, fig. 2, *e*.

Whorl, denotes one of the wreaths, turns or volutions of the shell, fig. 3, *f*.

Spire, comprehends in a general sense, all the whorls of the shell, the first or body wreath excepted, fig. 1, *g*.

Crown of the spire, fig. 4, *c*.

Suture of the spire or *whorls*, is the spiral line which separates the whorls, and which is sometimes sulcated, crenulated or somewhat projecting, fig. 1, *h*.

Pillar or *columella*, is the inner part of the left lip or column, which runs through the shell, from the lower extremity to the tip of the spire, and from which all the spires take their origin; the columella being situated as nearly as possible in the axis of the shell, and serving as its basis and support throughout. It is generally either flat, grooved, folded or truncated in that part which is visible at the opening, fig. 4, *i*.

Aperture, called in familiar language, the mouth of the shell, is the entrance to the chamber in which the animal resides, and is applicable to the openings of univalve and multivalve shells. The aperture is either entirely open, or closed by the operculum attached to the body of the animal, when the animal retires into its dwelling. This aperture varies in form in different shells, being angular, rounded, semi-lunar, linear or otherwise, and sometimes appear double, the inner margin being surrounded by an exterior one, fig. 2, *m*.

Lip, the expansion of the exterior part of the aperture constitutes the lip in labiated shells, and the wing in the alated kinds, fig. 4, *l*.

Beak or rostrum, is that part at the base which extends in a strait or slightly oblique direction from the bottom of the aperture, and is larger or smaller in different families, fig. 3, *n*.

Canal or gutter, an elongation of the aperture of the shell descending in a groove or gutter-like process. Some kinds of rostrated shells have the canal remarkably conspicuous, form-

ing a sinus from the aperture throughout the whole length of the beak, fig. 3, *o*.

Umbilicus is the opening or perforation in the lower part of the body, or first whorl of many spiral univalves, and is very conspicuous in a number of the trochus and nerita genus in particular. This umbilical preforation runs in a straight line from the base to the summit of the shell, forming throughout a spiral groove or gutter, which is wide at the entrance and tapers gradually towards the apex. This opening occurs in many shells at the base of the pillar, fig. 2, *u*. A shell without an umbilicus is termed imperforate; sometimes the term imperforate implies that it has neither umbilicus, nor canaliculation at the base.

Operculum is a testaceous or cartilaginous appendage, peculiar in a considerable degree to the univalve tribe of shells, and those only of the spiral or turbinated kinds. This appendage is not connected with the shell, but the animal; and serves like a lid or little door, to protect or close up the aperture of the chamber when the creature retires within its habitation.

Bivalves. These consist of two valves united by means of a cartilage, hinge, connection of the teeth or other process. In order to constitute a bivalve shell, it is only requisite that it be furnished with two connected valves without regard to their resemblance in form or dimensions. Some of the bivalves have both valves formed alike; in others they differ only in a slight degree, and again in others they are altogether dissimilar. Shells having both valves alike are called equivalves. Equilateral valves imply those which have both sides of the same valve alike, as for instance, when a longitudinal line is drawn from the beak to the opposite margin, the space on each side of the line is distinguished by the appellation of the right and left side; and when the form of both of those spaces correspond, the shell is equilateral: the inequilateral valves are the reverse of this, a line drawn as above described, from the beak to the opposite margin, presenting two sides of a very different shape. Sub-equilateral shells, are those having the valves nearly equal at both sides.

All bivalve shells do not completely close their shells; while others, when the shells are shut as closely as their form will allow, still exhibit a kind of hiatus, or gaping, either at the anterior or posterior end, or at both; and in some, when the valves are shut, both the anterior and posterior parts are closed, but an opening appears on one side of the beak.

One of the first circumstances to be considered is, which part of a bivalve shell ought to be deemed the base, because

when this is determined, every other part will fall progressively in their relative order under our observation. We name that part of the margin or limb which is situated in a direct line opposite the beak, the base of the shell.

Base of the bivalve shells, exemplified in *Venus verrucosa*, fig. 5, *v*.

Summit, a word applied in a general manner to the top or most elevated part of the two protuberances observable in the greater number of bivalves, fig. 5, *s*.

Beak, the pointed termination, apex, or tip of the protuberances last mentioned, and which, in many shells, turn spirally downwards, or obliquely, so that the beak itself is seldom the most elevated part of the shell.

Sides, the lateral parts of the valves distinguished by the epithets of right and left sides; in common language, the two valves of a shell are called the sides, but it is not understood as a term in conchology in this view, fig. 5, *x*, *z*.

Margin or *limb*, the whole circumference or outline of the shell, when laid flat down on one valve.

Disk, the convex centre of each valve or exterior surface, fig. 6, *d*.

Anterior slope, that part of the shell in which the ligament is situated; in the front view of the anterior slope, the beak falls back or behind, fig. 6, *e*.

Posterior slope, that immediately opposed to the former, and in which the beaks of the shell turn forward, fig. 6, *c*.

Lunule, the lunulated depressions below the beaks, either on the anterior or posterior slope, and sometimes on both; they may be distinguished under the appellation of anterior or posterior lunules, according to the slope in which they are situated, fig. 7, *a*, *b*.

Cartilage of the lungs, called also the ligament of the hinge, the substance of a flexible, fibrous and somewhat horny nature, by means of which the two valves are united near the beak, fig. 8, *c*.

Inside of the valve, exhibits the concave surface, fig. 7, *i*.

Ears, the lateral processes near the beaks, as in the scallop tribe: those occur either on one side, or on both, fig. 9, *e*, *e*.

Length and breadth of the shell. The length is measured from the cartilage or beak to the margin below; the breadth is of course taken in the opposite direction. The breadth of many bivalve shells exceed their length: some remarkable instances of which occur in the solen tribe, fig. 8, *a*, *a*, length; *b*, *b*, breadth.

Hinge, the point of union between the two valves, formed by the connection or articulation of the teeth in both valves, or by the teeth in one valve fitting into hollows or sockets in the valve opposite, fig. 8, *h*.

Byssus, the appendage called the beard; by means of which some bivalves fasten themselves to the rocks.

MULTIVALVES. The shells of this order are few, compared with either of the preceding; and the terms proposed for those, are applicable for the most part to the multivalves. The following require more explicit mention.

Base, that part of the shell upon which it rests: in the lepas tribe it implies the part immediately seated upon the stem or pedicle; in the balani, the base is generally larger than the summit, and is the bottom by means of which the shell is fixed upon the rocks or other extraneous bodies, fig. 10, *a*.

Ligament, the substance, whether membranaceous or tendinous, which serves to connect the valves together. The connection of the valves in some multivalves is formed by the parts of one valve locking into another, fig. 11, *v*, *v*.

Operculum. The balani have the aperture at the summit closed by means of four small pieces of valves, which are commonly called the operculum; these opercula of the balani are, however, very different from those of univalve shells, fig. 10, *o*.

Such are the general terms applied to the parts of shells.

The animals which inhabit shells are classed in the grand division Mollusca of Cuvier. In this division the sentient principle is lodged in a number of medullary masses, dispersed in different parts of a soft body. And though the medullary masses are not always united by nervous filaments, the organs of sense and motion are arranged more or less on two sides of a nervous axis or longitudinal series of medullary masses.

The principal medullary mass is situated upon the throat. The circulatory system is considerably complicated; much more so than that of the articulated division. The blood is dark-colored or blue. Fibrin appears more abundant than in vertebral animals. Their muscles are attached to many parts of the skin, forming a tissue more or less complicated and compact. By various contractions and elongations they move, swim, and perform other motions. They have considerable irritability; the naked skin is very sensible and furnished with a liquid humor which issues from its pores.

Molluscous animals are likewise arranged into classes, orders, genera, species and varieties, a full account of which cannot be given in the small extent allotted to this work.

To those who wish to make conchology a study, we can only recommend them some of the late works of the authors heretofore enumerated.

Having given the general terms applied to the parts of shells, we next purpose to inquire what is the nature of their substance, and in what way it is produced by the animal, and how it is enlarged as the animal increases in size. These topics shall be the subject of these essays, which may be conveniently divided into the following sections. 1. Of the constituent parts of shells. 2. Of their formation. 3. Of the colors of shells. 4. Of the formation of the umbilicus and protuberances, &c. 5. Of the pearl and pearl fishery.

ORNITHOLOGY.

NO. III.

Eggs of birds. By experiment it appears that birds do not instinctively know the necessary time of incubation; for unincubated eggs of a bird have repeatedly been taken and placed under another of the same species, which was on the point of hatching, and *vice versa*, those on the point of hatching into the nest of such as had only began to sit; and in both cases the young were brought to maturity. Birds will sometimes discriminate the egg of another species put into their nest, and will turn it out; but they will frequently breed up the young of another when exchanged, provided they are of the same age, and not very large when the experiment is made.

Those who suppose a bird capable of producing eggs at will, or that any bird is excited to lay more eggs than usual by daily robbing their nest, are certainly mistaken. In a domesticated fowl it is probable the desire of incubation may be prolonged by leaving a little or nothing in the nest to sit on. It will therefore lay the number allotted by nature, which is determined before the first egg is produced. If it is prevented from incubation by any means whatever, it may begin again to lay in five or six days; but there is always an interval of a few days, and sometimes as many weeks, which must wholly depend on the age and vigor of the bird. When it happens that a fresh lot of eggs is laid with only a few days' interval, and that perhaps in the same nest, it is deemed a continuation for want of nice observation; but we are not to look to domesticated animals for natural causes, for those are taken from

their state of nature. Let us look to the birds in their natural wild state, and see if any well-attested instances are to be found where they have laid more eggs successively, by taking one from the nest daily. For instance, the number laid by the robin is commonly five, sometimes only three or four, and rarely six; will the taking away the daily-laid egg produce the seventh or eight? No: we believe there never was an instance. A bird will only lay the usual number peculiar to the species; and if, at the period of incubation, it perceives the nest emptied, it is deserted. The link of nature having been broken, the female stimulates to love again, and soon brings forward by that stimulus, aided by the male fecundity a new lot of eggs; never more than the former, and usually less, because this is a forced production, at the additional expense of the vigor of the bird, and loss of animal parts, which is the cause of a great variation as to the number of eggs laid by domestic fowls, depending entirely on the strength of the constitution and the nourishment of the food. In all animals taken immediately under the care of man, the dictates of nature are partly suppressed, their food changed, habits and manners altered, and disease often ensues, which is the origin of the great variety of colors in reclaimed animals.

Nature pursues invariably one course; therefore to draw a general rule of her actions we must strictly adhere to her in an unmolested, uncultivated state; for if we deviate from that we must infallibly err. We do not mean to say accidental varieties do not take place in animals unreclaimed, but such *lusus* are by no means common; and when we see a bird materially deviate in color from its species, we may consider it as a constitutional defect, that the natural secretions are changed or suppressed with which the feathers are dyed. To enter minutely into a discussion on this head would swell this article beyond its limits; all we wish is, to point out the necessity of strictly adhering to nature for observations on natural causes. A domestic fowl which will sit for six weeks upon an empty nest, is not to be produced as a proof of the actions of nature. Will any bird, in its natural wild state, continue to sit on its nest after the eggs are taken out? One egg, indeed, is sometimes sufficient to produce the act of incubation; but what is it then that prevents the secondary egg from coming forward, when it is well known if a bird is prevented from setting, she soon resumes her desire of propagation natural to every animated being? Because the very act of incubation is the effective cause; the line

which nature has drawn, and which the animal by instinct feels. We conceive the production of a second lot of eggs to be an extraordinary exertion of nature; a wonderful proof of the affection of the all-wise Creator for the preservation and continuation of his creatures, and the resources he has furnished some animals with, in case of necessity, to prevent the total extinction of the species. It is but few birds, if any, that would produce a second lot of eggs in the same season if unmolested; but if their nests are destroyed, it is probable three or four separate lots may be protruded.

We have never been able to discover in the earliest breeders of birds, the production of a second brood after the first has been brought to maturity. Their attention to their young continues long after they leave the nest. The great exertion to collect food for so many must exhaust the animal spirits, to recruit which is a work of time; so that the season is too far advanced for a second production. The secondary eggs being brought forward is not effected by the will of the bird, but is caused by the dictates of nature, the impulse of love.

The extraordinary and rapid growth is also worthy of notice. We before observed, there is a line drawn by nature to prevent more than a certain quantity of eggs, peculiar to each species, being fecundated at once; otherwise a bird in one season might produce all the eggs she possessed, and afterwards become useless in propagation.

But notwithstanding only a portion of the *ovaries* are impregnated at the same time, yet the stimulus to love considerably increases the size of all the eggs of the *ovarium*. When the stimulus ceases, be it from what cause it may, the organic particles excite love by distending those parts necessary for production; so, on the contrary, the want of a sufficient quantity reduces them to their primitive state. It seems absolutely necessary that a dilation of the *ovaries* should take place before they can be fecundated; and that, by the law of nature, only a certain number should be sufficiently large to be impregnated at the same time; and that no others can possibly receive the male stimulus till after the first set are produced. A superabundance of organic particles is cause sufficient to separate an egg from the *ovarium* without male contact. It is possible a bird, in its natural state, may lay an egg unimpregnated, which may account for addled eggs being found in nests. Birds have been found sitting on eggs perfectly dried up. This also seems to prove that birds do not know the necessary time of incubation.

Immediately under the shell, lies that common membrane or skin, which lines it on the inside, adhering closely to it every where, except at the broad end, where a little cavity is left, that is filled with air; which increases as the animal grows larger. Under this membrane are contained *two whites*, though seeming to us to be only *one;* each wrapped up in a membrane of its own, one white within the other. They differ from each other in specific gravity. In the midst of all is the *yolk*, wrapt round likewise with its own membrane. At each end of this are two ligaments, called *chalazæ*, which are white, dense substances, made from the membranes, and serving to keep the white and the yolk in their places. They are called chalazæ from their resemblance to hail.

The *cicatricula* is the part where the animal first begins to show signs of life; it resembles a vetch or small pea lying on one side of the yolk and within its membranes. The outer membranes and ligaments preserve the fluids in their proper places, the white serves as nourishment; and the yolk with its membranes after a time, becomes a part of the bird's body.

The growth of an egg after impregnation is exceedingly rapid; the yolk only is formed in the *ovarium*, where it remains till within twenty-four hours of being produced; when that part is fully matured, it separates and falls down the *oviduct* into the *uterus*, where the egg is perfectly formed; first the *vitellus* or yolk is surrounded by the *albumen* or white; and lastly is covered with a calcareous shell. The very expeditious growth of these last, appear to be an extraordinary exertion of nature. The calcareous covering of an egg is concreted and formed in a most expeditious manner; a few hours only seem necessary for this work. Only one *vitellus* separates from the *ovarium* at a time, (except as we shall hereafter mention,) till the exclusion of which no other succeeds. But as this is a daily production, with few exceptions, there is no more time allowed for perfecting the *albumen* and shell than twenty-four hours.

As the course of nature is obstructed by remote causes, there are few general rules without some exceptions; but an individual deviation by no means perverts the law of nature, but is simply an individual defect. We shall here instance imperfect eggs sometimes produced, such as want the *vitellus*,* and others containing two yolks; and although

* The *centininum Ovum* of naturalists, vulgarly called a cock's egg. This name has been given to it from a supposition that it was the 100th egg, or the last the bird could lay.

there are probably very few instances of such productions from birds in their wild state, yet it is no uncommon thing in domestic fowls.

We are also told of eggs with double shells; and we frequently see eggs without any calcareous covering, but wrapped in a soft pliable skin like vellum.

To account for these extraordinary productions, we must conceive a defect exists at the time in some part of the animal body; and as the *vitellus* and *albumen* derive their origin from different parts, it is natural to conclude, in those preternatural eggs destitute of yolk, the cause proceeds from some defect in the *ovarium*. May it not be occasioned by an unequal stimulus in the parts necessary to perfect the egg, and that the growth of the *vitellus* is not in proportion to the *albumen*? Thus while the vesicles appointed for collecting, preparing and uniting the organic particles of the *albumen* in the *uterus* have all their effective powers, those of the *ovarium* are weak; of course the one goes on with the operations appointed by nature, while the other is stopped in its progress for want of a sufficient quantity of organic matter to bring it to perfection at the same time. Hence the reason of the common fowls sometimes producing three or four imperfect eggs following, by which the *vitellus* becomes sufficiently large, and a regular succession of perfect eggs are produced. On the contrary, when, from the same causes, the growth of the *vitellus* in the *ovarium* is too luxuriant, two yolks pass the oviduct together, which being surrounded with the usual quantity of the *albumen*, is brought forth in the form of a single egg of an extraordinary size. From these it is possible that twins are produced, but more frequently deformities, which are seldom hatched.

Color of Eggs. It was a notion of Darwin's that the variety in the colors of eggs, as well as in the colors of many animals, is adapted to the purposes of concealment from their natural enemies. Thus, he remarks that the eggs of the hedge chanter are greenish blue, as are those of crows, which are seen from beneath in wicker nests, between the eye and the blue of the firmament. M. Gloger, a German naturalist, has followed up this singular theory into some detail, and considers it to be a remarkable provision of nature, that birds whose nests are most exposed, and whose eggs are most open to the view of their enemies, lay eggs of which the color is the least distinguishable from that of surrounding objects, so as to deceive the eye of birds, or of other plundering animals; while birds, the eggs of which have a bright decided color,

and are consequently very conspicuous, either conceal their nests in hollows, or only quit their eggs during the night, or begin to sit immediately. It is also to be remarked, that in the species of which the nest is open, and the female brings up the brood without the assistance of the male, these females are generally of a different color from the male, less conspicuous, and more in harmony with the objects around. The foresight of nature, has, therefore, provided for the preservation of the species of which the nest is altogether exposed, by imparting to the eggs a color which will not betray them at a distance; while she could, without inconvenience, give the brightest color under circumstances where the eggs are concealed from view. Or, perhaps, to speak more correctly, numerous birds can deposit their eggs in places accessible to view, because the color of the eggs make them become confounded with the surrounding objects; while other birds are obliged to conceal their nests, because the conspicuous color of the eggs would have attracted their enemies. Let the explanation, however, be what it may, the fact exists, and M. Gloger, who has examined all the birds of Germany, is said to have satisfactorily proved it. Eggs then must be distributed into two series, according as their color is simple or mixed. The simple colors, such as white, blue, green, yellow, are the brightest, and consequently the most dangerous for the eggs. The pure white, the most treacherous of colors, is found among birds which breed in hollow places, like the woodpeckers, the kingfisher, the swallow and the martins. It is only among such birds that the eggs are of a remarkable whiteness. The eggs are also white among some species, which, like the marsh wren, construct their nests with such narrow openings, that the eye of their enemies cannot penetrate within. White eggs are also found with birds that quit them only during the night, or at least very late in the day, such as the owls and falcons. Lastly, this color is found among birds which lay only one or two eggs, and sit immediately after, like pigeons. As to the bright green or blue color, it is found to belong to many species which make their nests in hollows, like the blue bird. In the second place, this color is common to the eggs of birds, the nests of which are constructed of green moss, or placed at least in the midst of grass, but always well-concealed; such for example as Wilson's thrush. Lastly, green eggs are met with among many strong birds able to defend themselves against plunderers, like the herons. A bright green color, verging towards a yellowish tint, is found among the eggs of many birds which

lay among the grass, without making a finished nest, which soon disappears beneath the quantity of eggs. The same color is also remarked among several birds, which quit their eggs when they lay them, but which are attentive in watching them, as swans, ducks and geese. The eggs of certain great birds which make their nests in the open air, but are well able to defend themselves, are a dirty white, as may be observed among the vultures and eagles. Among the eggs of a mixed color, they are to be distinguished which have a white ground, and those of which the ground differs from white. Most of the eggs with a white ground are concealed in well covered nests.

With all due deference, however, to M. Gloger, we would remark that the theory appears to us much more beautiful and ingenious than true; for we could enumerate more instances in which the principle fails than holds good. If we admit that the brightest white eggs are to be found in birds whose nests are the most concealed, may we not rather infer that, because the interior of these nests is peculiarly dark, the bright white color is convenient to the bird, to enable her to distinguish them? At all events, we must regard M. Gloger's hypothesis as ingenious, rather than supported by facts.

CABINET CYCLOPÆDIA.

SILK MANUFACTURE.

NO. III.

CULTURE OF THE MULBERRY. 'The first object of attention, preparatory to any extensive attempt for the production of silk, must be the culture of the mulberry tree, the leaves of which form the sole subsistence of the silk worm.

'This tree, the *Morus* of botanists, is a genus of the tertrandria order, belonging to the monœcia class of plants. Linnæus enumerates seven distinct species of the mulberry tree.

'The *Nigra*, or black-fruited species, is well known in this country, and much prized for the fruit which it so abundantly bears. Any particular description of it here would be superfluous.

'The *Alba*, or white-fruited mulberry, differs from the nigra in having its stem straighter, and its bark smoother, and of a lighter color. Its leaves are likewise smoother, thinner, much

smaller, and of a lighter green. The fruit, which is of a pale gray color, is small, of a vapid sweetness, and of no value.

'The *Rubra*, or red Virginia mulberry tree, differs but little from the alba, except in the red color of its fruit.

'The *Tartarica*, or Tartarian species, abounds on the banks of the Volga and the Tanais.

'The *Papyfera*, or paper mulberry, differs from the other species in having palmated leaves. From the bark of its branches the Japanese prepare their paper. Its leaves are also used as food for the silk worm, for which purpose the tree is now successfully cultivated in France.

'The two remaining species, the Tinctoria and Indica, are not used for the nourishment of the silk worm.*

'The mulberry tree is hardy, of quick growth, and easily naturalized in all climates. The black species has always been cultivated for its fruit in Europe. The white sort comes from India, whence it has been introduced into all those western countries which have attempted the culture of silk.

'The respective qualities of the different species, as connected with the silk worm, cannot be better pointed out than by observing, that if leaves of the white, the red, and the black mulberry be given at the same time to the insect, it will eat first the white, next the red, and lastly the black, in the order of the tenderness of the leaves. The Tartarian seems to hold as high a place in its esteem as either the red or black kind: all, however, give place to the white, which, as it came originally from China, would appear to be its most natural food.

'Most writers on the subject affirm that the white mulberry is always used in China, while some few assert that the Chinese now feed their silk worms on the Tartarian species.

'The white sort is generally planted for this purpose in Europe, its leaves being more eagerly desired by the worms. The trees of this species likewise possess the advantage of coming into leaf a fortnight earlier than the black, for which reason the eggs may be hatched earlier in the spring, and the cares of rearing the insects are not prolonged too far in the hottest season. The white mulberry tree is likewise of quicker growth, is not so much injured by the constant picking of its leaves, nor is it, like the black, incommoded by a

* Besides the above named species of the mulberry tree, there is one which we believe, from recommendations, to be superior to all others for the Culture of Silk. We allude to the Chinese Mulberry (*Morus Multicaulis,*) for a description of which see Vol. I. p. 315, Naturalist, or p. 21 Cobb's Manual on Silk. ED.

great quantity of fruit. The best reason, however, if it be correct, that has been given for preferring it, is, that the silk of worms which feed upon its leaves is finer than where other kinds are substituted. Count Dandolo has, indeed, found, that the quality of the filament does not solely depend upon the food of the insect, but is also influenced by the degree of temperature in which it is reared.

'In cold climates, the black thrives better than the white mulberry. It likewise bears double the quantity of leaves suitable for food. In Persia the silk worm is nourished altogether by leaves of the black species. In Granada, where silk of excellent quality is produced, the same system is followed. Swinburne, who travelled in Calabria in 1784, relates that the red species was there generally preferred, because the leaves, not appearing until ten or fourteen days later than those of the white mulberry, are therefore less subject to injury by frost. This reason for its preference is in other climates assigned as the cause of its rejection.

'The roots of the mulberry tree strike very deep into the ground, so that the surface not being impoverished as it is by many trees, whose roots are found more in the upper soil, other kinds of cultivation may be prosecuted around it. Neither its shade, nor the dropping of rain from its leaves, is considered prejudicial to plants growing beneath.

'Moist lands in valleys and near rivers induce a very rapid growth in the trees; but their leaves contain, in such situations, too much watery matter, and, though eaten voraciously, are hurtful to the worms from their comparative want of nourishment. The labors of the insects are also delayed, and the quality of their produce injured by the weakness of constitution resulting from this cause.

'Trees in dry soils give fewer leaves, but any deficiency in their quantity is amply compensated by the greater nutriment which they afford, and, as a necessary consequnece, by the superior quality of the silk produce.

'It is remarked by Mayet, that the quality of the silk depends upon that of the mulberry leaves consumed, "which are then to be considered as being only a mine worked by the worms; and this mine is more or less proper to furnish the fine substance, according to the soil and climate."

'The mulberry tree is readily raised, either by cuttings, by layers, or by seed. In countries where the seed must be saved until the favorable season for sowing it shall come round, the process is both troublesome and difficult. Pullein, who wrote in the year 1758, gives very elaborate directions, which

he considers necessary for properly saving and preparing the seed. In climates where this delay in sowing is not necessary, the operation is more simple. The plan pursued in France is curious: it is thus described:—"Take the ripe berries when they are full of juice and seeds. Next take a rough horse-hair line, or rope such as we dry linen on, and with a good handful of ripe mulberries, run your hand along the line, bruising the berries and mashing them as much as possible as your hand runs along, so that the pulp and seed of the berries may adhere in great abundance to the rope or hair line. Next dig a trench in the ground where you wish to plant them, much like what is practised in kitchen gardens in England for crops of various kinds. Next cut the rope or hair line into lengths, according to the length of the trench you think fit to make, and plunge the line full of mashed berries into the trench; then cover it well over with earth, always remembering afterwards to water it well, which is essential to success. The seeds of the berries thus sown will grow, and soon shoot out suckers, which will bear young leaves, which are the best food for the silk worm. The facility and rapidity with which young leaves may by this means be produced, is evident; for as many rows of trenches can thus be filled as can be wished; and it can never be necessary to have mulberry trees higher than our raspberry, currant or gooseberry bushes. Whenever they get beyond that, they lose their value; and if these branches succeed, you may have a supply coming fresh up day after day, or any quantity you please."

'Snails and slugs are found to be very destructive to the young mulberry shoots, committing great devastations in a short period. In moist seasons a whole nursery is sometimes threatened by them with ruin. To protect the tender plant from this evil, it is recommended to surround the beds or trenches with dry soot or ashes, sprinkling afresh after rain. This protection might be advantageously adopted with other plantations, as slugs will not pass over such a fence, especially while it is dry.

'In England, and countries of similar temperature, seedlings will not attain a greater height than three inches in the first year. In warmer climates their growth is much more rapid; so that in some parts of India large quantities of seed are sown, whose crops are mowed down in the ensuing season as food for silk worms. Sprouts again spring forth from the roots the same year, and are used for a second brood. The silk produced by worms fed on these tender shoots is supposed

to be readily distinguishable, by its superiority over that produced when the insect is fed on the leaf of the full-grown mulberry tree.

'Plants which are raised from seed require transplantation at the end of the third year, to induce the spreading of the root. Without this removal they would acquire only one root, like a pivot, and would be liable to various casualties on that account. Some cultivators believe that it assists this branching out of roots, if the plants are cut even with the ground at the end of the second year.

'The most easy and expeditious way of raising mulberry trees is from cuttings. Although as great a number cannot so readily be raised in this manner as from seed, there is a great advantage in point of strength as well as in the rapidity of their growth. This method of propagation is much more successful in moist and temperate climes than in such as are exposed to the arid heat of the lower latitudes. Cuttings will put forth shoots of about five or six inches in length during the first summer, and will, at the same time, be providing themselves with roots. If they have put forth shoots, and preserve their leaves until the autumn, the plants will generally succeed: any which have failed to do so must be replaced by other cuttings. In the course of the ensuing spring and summer, if carefully watered, the shoots will frequently attain the length of eighteen inches. In the autumn following the beds must be thinned, and the redundant saplings planted out.

'Mulberry plantations which are formed in France and Italy consist of large standard trees. This is a very inconvenient method; as the leaves cannot be gathered but by the aid of ladders, and by climbing among the branches. In this way the trees may sustain much injury; besides which a great deal of time is unnecessarily wasted in reaching the leaves, which then are seldom gathered with regularity.

'Du Halde, in his history of China, relates that the Chinese are particular so to place and to prune their mulberry trees, that the leaves may be gathered in the easiest manner, and without risk of damage to the trees. These are, with this view, cut in a hollow form, without any intersecting branches in the middle; so that a person going round the tree may gather all the outside leaves, and afterwards, by standing withinside, and merely turning round to the different parts, may pluck the leaves growing within. The trees are not allowed to grow to any great height; so that each tree forms a sort of round hedge, and may be reached throughout without climbing on its branches.

'Pullein gives very ample directions for forming and rearing plantations of mulberry trees. His work has been considered one of high authority, and may be profitably consulted by any who require more minute information than it is desirable to furnish in this volume.

'Ingrafting is considered to be one of the surest methods of obtaining nutritious leaves from mulberry trees. Monsieur Bourgeois observes, that mulberries ingrafted on wild stocks, when the graft is chosen from a good kind, such as the rose-leaved or the Spanish mulberry, produce leaves which are much more beautiful, and of much better quality for feeding silk worms, than such as are ingrafted on the common wild stock. The same observation has been made by Monsieur Thomé, whose authority is of the greatest weight in whatever relates to the rearing of silk worms, to which object he devoted forty years of his life.

'Although ingrafted mulberries certainly produce a greater number of leaves than the wild trees, and these leaves are thought to contain more nourishment to the insect, yet the wild tree has an advantage over that which is ingrafted, in its superior longevity. The former has been known to exist for two centuries; while the increased quantity of leaves produced by ingrafting causes a premature dissipation of the sap of the tree, and accelerates its decay. Monsieur Pomier, in a treatise which he has written upon the subject, recommends that white should be ingrafted on black mulberries; and the reason urged for the adoption of this plan is, that the white species commonly decays first in the root, while the black is not subject to any disease.

'The more attention that is bestowed upon the tree, by dressing and pruning the overgrown branches, the greater abundance of good leaves will it furnish. It is very hurtful to the trees to strip them when too young, because leaves are organs which fulfil important functions in plants, contributing greatly to their nutrition by absorbing vessels, which imbibe moisture from the air. The leaves may be safely gathered after the fifth year. Mulberry trees are so plenteously stored with sap, that they sometimes renew their leaves twice or thrice in the same year. When the winter has been mild, they put forth leaves very early; but it is always dangerous, in any but hot climates, to accelerate the hatching of the worms in expectation of this event; for no leaves should be depended on till the beginning of May, as those which appear prior to this period are exposed to destruction from frost.*

* For the culture of the mulberry in this country see Vol. I. p. 86. et seq. Naturalist, or Cobb's Manual. ED.

'According to Monsieur Nollet, the inhabitants of Tuscany, especially in the neighborhood of Florence, do not cultivate half as many trees as the Piedmontese, in proportion to the number of silk worms reared and the quantity of silk produced. This economy is realized by causing the worms to be hatched at two separate periods. The first brood is fed on the first leaves of the spring; and when these worms have gone through their progressions, and have produced silk, other eggs are hatched, and the insects are nourished by a seccond crop of leaves furnished by the same trees. This plan is followed in China, where two crops of silk are obtained in the year; and it has been said that in some other parts of Asia as many as twelve broods of worms are reared in the course of one year. In the Isle of France Monsieur Chazal obtained three generations between the months of December and May; the mulberry tree there, as well as in India, affording fresh leaves through the whole year.

'Count Dandolo is of opinion that in Italy it is disadvantageous to obtain more than one crop in each season. He affirms that the mulberry tree cannot bear this constant stripping of its leaves without injury. "All things considered," says he, "I am well persuaded that one of our good crops will be equal in produce to any number that may be gathered elsewhere in a year." It is observed that the quality of the silk obtained in Italy from their seccond *racolta* is always inferior to that from the first brood of worms.

'The Persian cultivators are accustomed, from a motive of economy, to feed silk worms upon boughs of the mulberry tree, instead of using the leaf separately, as is practised in all temperate climates. The leaves, continuing attached to the branches, remain longer fresh, have a better flavor, and are more nutritious, than those separately gathered, and the silk worms feed from the branches with less waste than when the leaves are strown singly over them.

'In estimating the qualities of the mulberry leaf, as regards nutrition, it should be considered as being composed of five different substances: the solid or fibrous, the saccharine, and the resinous substances, water, and coloring matter.

'The fibrous substance, water and coloring matter, cannot be said to contribute towards the nourishment of the silk worm. The saccharine matter is that which sustains the insect, causes its increase in size, and goes to the formation of its animal substance. . The resinous substance, according to Count Dandolo, is that which, "separating itself gradually from the leaf, and attracted by the animal organization, accumulates, clears itself, and insensibly fills the two reservoirs or silk

vessels. According to the different proportion of the elements which compose the leaf, it follows, that cases may occur in which a greater weight of leaf may yield less that is useful to the silk worm, as well for its nourishment, as with respect to the quantity of silk obtained from the animal."

'To complete the developement of the silk worm, the quantity of leaves consumed must bear relation to the nutriment they contain. It is therefore important that leaves containing the most nutriment should be supplied to the insect, as it is more fatigued and more liable to disease from devouring many leaves, than it would be if an equal quantity of nourishment were supplied by fewer leaves containing more saccharine substance. Again, if this abounds in the leaf, and the resinous substance is not found united with it in sufficient quantity, the worm will, it is true, thrive and grow, but will not produce silk proportionate to its weight.

'In some parts of Italy and France, mulberry leaves are commonly sold by weight in the market, and those who rear silk worms are often wholly dependant on this source for supply. Judgment and experience are required in the purchaser, to enable him to make a proper selection of leaves, choosing such as are of a nourishing quality, and rejecting those whose sale would, from their greater weight, be more profitable to the vender. The interest of the two parties are consequently at variance. In other places, trees are hired for the season; from four to six francs, according to its size and condition, being paid for the hire of each tree. Under equal circumstances, an old mulberry tree always yields better leaves than a young one; and whatever may be the original quality of the tree, as it grows older the leaf will diminish in size, and will so materially improve, that at length it will attain to a very excellent quality.

'It is of importance that the age of the leaves should keep pace with that of the worms. The young leaf, being replete with aqueous matter, provides for the great evaporation continually proceeding from the body of the young worm; while the mature leaf contains a larger proportion of solid nutritive matter, better suited to the wants of the insect at its more advanced age. To give old leaves to young worms, or young leaves to old worms, would be alike prejudicial.

'The greatest care must be taken to prevent the leaves becoming heated or fermented. The nutritious substance of the leaf is altered and injured by the slightest fermentation, and it becomes too stimulating for the health of the worm. It is also essential that the leaves be given to the insects perfectly dry; contagious and fatal diseases will otherwise ensue.

'It is considered that a well-cultivated mulberry tree should yield, in each season, about thirty pounds of good leaves. It is not uncommon in the south of France to see large trees which will furnish five times this quantity.

'It is said that no insect except the silk worm will feed on the mulberry leaf. Pullein tried the speckled hair caterpillar, which feeds on the nettle, as well as several other kinds of insects, but they all rejected the mulberry leaf for their food. Once, indeed, he discovered upon a mulberry tree a green worm, about an inch long and as thick as an oat straw. He confined it in a box, and fed his prisoner with mulberry leaves. Pullein believes that it was not a native of the tree, but found itself there accidentally when it was taken. During the continued observation of three years, Miss Rhodes never once found an insect upon the leaves used by her. Other fruit trees and vegetables in the same garden were sometimes covered by myriads of insects, while the mulberry tree, surrounded by these ravagers, remained sacred from their depredations. Not even the aphides invade this tree, exclusively devoted to the use of the silk worm.'

DIFFERENCE OF CLIMATE.

A NOTICE to emigrants, by the society for forming a settlement in the Oregon Country, on the Columbia river, reminds us of some interesting facts connected with climate, which are, we imagine, new to most of our readers. One grand peculiarity, not yet explained satisfactorily, is the superior mildness of the climate of the western coast of a continent or island, over the eastern, or opposite coast, in the same latitude and elevation.

Thus, for example, while all is sterility and desolation on the eastern coast of North America, even as low as the 55th degree of north latitude, and ice and snow maintain a perpetual existence at the 60th parallel, we find on the coast of Norway, or western coast of Europe, ten degrees higher, that all is life, animation and beauty.

The difference of climate between the western coast of North America and the eastern coast of Asia is still more surprising, when we reflect that the parts of the two continents to be compared are only separated from each other by a strait, rather more than forty miles in width. Kotzebue, in his voyage of discovery, undertaken in 1815, informs us that the crossing of a short extent of water, from America to Asia, was like passing

from winter to summer. While all was verdure at Cape Prince of Wales in America, the opposite point of East Cape in Asia was covered with eternal ice. A few hours sailing directly to the west sank the thermometer from 59° to 43° F.

The general agent of the Oregon Society says, 'that the climate on the shores of the Columbia river is remarkably mild and healthful.' A person ignorant of the difference of climate between the two coasts of a continent, might naturally enough look at his map, and having discovered what spot of the eastern or Atlantic coast was of the same latitude as the mouth of the Columbia river, he would infer the mean annual temperature of the latter to be the same as that which he knows the former to possess. He would be deceived in that case, as in any other in which he would take parallels of latitude to measure climates, without reference to numerous modifying causes; among the chief of which, is the kind of exposure just mentioned.

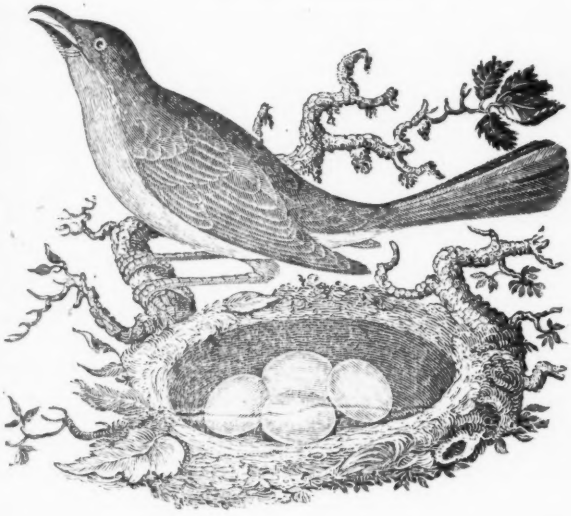
In New California, on the Pacific ocean, they cultivate with success the olive along the canal of Santa Barbara, and the vine from Montercy to the north of the parallel of 37° N. latitude, which is that of the country near the mouth of the Chesapeake Bay. The mouth of the Columbia river, in lat. 44° 40′ N. has a mean temperature of 55° F., the same as that of Pekin, in China, on the opposite continent, in lat. 39° 54′ N. Philadelphia, on the eastern side of the continent, is in about the same latitude as Pekin, or nearly five degrees farther south than the mouth of the Columbia river, and yet its mean temperature, 52° F., is three degrees less than that of the latter.

In corroboration of these views, for which we are indebted to the celebrated traveller Humboldt, it may be mentioned, that on the shores of the narrow channels of the Bosphorus and Dardanelles, dividing Europe from Asia, the western coast of the latter continent has a more genial climate than that of the former. In the spring, says Wittman, vegetation is several weeks more advanced on the Asiatic than on the European side, and the productions of the soil more vigorous and of larger growth.

So far, we see that marine exposures to the west appear to give a milder climate; and if we carry our investigations farther, we shall find that the mean annual temperature of places in the same latitude diminish as we advance to the east. Thus Warsaw, the capital of Poland, has a less medium temperature than Amsterdam, on the same line of latitude; is hotter in summer and colder in winter. Astrachan, at the mouth of the Volga, is nearly in the same latitude as Lyons.

The Crimea is not so warm as upper Italy, to which it corresponds, and although it also presents, equally with the latter, low grounds. Pekin is in the same parallel as Naples, but with less medium temperature, and exposed to much greater vicissitudes.

The interest with which the subject of climate is always studied, as well by the physician as by the naturalist and agriculturist, will justify our indulging in further details hereafter. We shall then show, that even the mean temperature of a place gives but an imperfect idea of its climate, unless we know the difference beween its temperature in summer and in winter.—*Journal of Health.*



THE CAT BIRD.

(*Turdus felivox*, Vieill. *T. lividus*, Wilson, ii. p. 90. pl. 20. fig. 3. Phil. Museum, No. 6770.)

Sp. Charact.—Dark slate color, paler beneath; the vent rufous; the crown and tail black, the latter rounded.

This quaint and familiar songster probably passes the winter in the southern extremities of the United States, and along the coast of Mexico, from whence, as early as February, they arrive in Georgia. About the middle of April they are

first seen in Pennsylvania, and at length leisurely approach this part of New England, by the close of the first or beginning of the second week in May. They continue their migration also to Canada; but whether they proceed into the desolate arctic wilderness or not, we are ignorant. They are said, however, to inhabit Kamtschatka, and consequently penetrate very far to the north. Throughout this extent, and to the territory of the Mississippi, they likewise pass the period of incubation and rearing their young. They remain in New England till about the middle of October, at which time the young feed principally upon wild berries.

The cat bird often tunes his cheerful song before the break of day, hopping from bush to bush, with great agility, after his insect prey, while yet scarcely distinguishable amidst the dusky shadows of the dawn. The notes of different individuals vary considerably, so that sometimes his song, in sweetness and compass, is scarcely at all inferior to that of the Ferruginous thrush. A quaintness, however, prevails in all his efforts, and his song is frequently made up of short and blended imitations of other birds, given, however, with great emphasis, melody, and variety of tone; and, like the nightingale, invading the hours of repose, in the late twilight of a summer's evening, when scarce another note is heard but the hum of the drowsy beetle, his music attains its full effect, and often rises and falls with all the swell and studied cadence of finished harmony. During the heat of the day, or late in the morning, the variety of his song declines, or he pursues his employment in silence and retirement.

About the twenty-fifth of May, one of these familiar birds came into the Botanic Garden, and took up his summer abode with us. Soon after his arrival he called up in low whisperings the notes of the *whip-poor-will*, the red bird, the *peto peto* of the tufted titmouse, and other imitations of southern birds, which he had collected on his leisurely route from the south. He also soon mocked the *'tshe-yàh 'tshe-yàh* of the little Acadian flycatchers, with which the neighborhood now abounded. He frequently answered to my whistle in the garden, was very silent during the period of incubation, and expressed great anxiety and complaint on my approaching the young after their leaving the nest. According to Latham, the cat bird is also capable of imitating the variable airs of instrumental music, and will sometimes mimic the cry of chickens so as to deceive and distress the hen that attends them.

One of the most remarkable propensities of the cat bird, and to which it owes its name, is the unpleasant, loud and

grating cat-like *mew* (*pay, pay, pay*) which it often utters, on being approached or offended. As the irritation increases, this note becomes more hoarse, reiterated and vehement; and sometimes this petulence and anger are carried so far, as to persecute every intruder who approaches the premises. This temper often prevails after the young are fledged, and though originating, no doubt, in parental anxiety, it sometimes appears to outlive that season, and occasionally becomes such an annoyance, that a revengeful and fatal blow from a stick or stone, is but too often, with the thoughtless and prejudiced, the reward of this harmless and capricious provocation. At such times, with little apparent cause, the agitation of the bird is excessive; she hurries backward and forward, with hanging wings, and open mouth, mewing and screaming in a paroxism of scolding anger, and alighting almost to peck the very hand that offers the insult. To touch a twig or branch in any part of the garden or wood is often amply sufficient to call down the amusing termagant. This harmless excess, and simulation of grimalkin's tone, that wizard animal, so much disliked by many, are unfortunate associations in the cry of the *cat* bird; and thus coupled with an ill name, this delightful and familiar songster, who seeks out the very society of man, and reposes an unmerited confidence in his protection, is treated with undeserved obloquy and contempt. The flight of the cat bird is laborious, and usually continued only from bush to bush; his progress, however, is very wily, and his attitudes and jerks amusingly capricious. He appears to have very little fear of enemies, often descends to the ground in quest of insects, and though almost familiar, is very quick in his retreat from real danger.

This common and abundant species begins to construct its nest some time in the month of May. The situation in which he delights to dwell, is commonly a dark thicket, in the woods, or close bush in some recluse part of the garden, at the distance of five or ten feet from the ground, according to the convenience of the situation. The materials are coarse but substantial; the external part is commonly made of small interlaced twigs, old grass and dry leaves; to these succeed thin strips of bark, often of the red ceder, somewhat agglutinated. The inside is lined and bedded with black root fibres of ferns; other accidental materials sometimes make a fantastic part of the fabric. One has been known to carry away an edging of lace which was missed, and at length again recovered after the rearing of the brood, whose dainty bed it assisted to form. I have frequently found in the external coat

of the nest, the cast off skins of *snakes*, more rarely bits of newspapers, wood shavings, strings, and bass-mat strips. The eggs are four or five, of a bright and deep emerald green, and without spots. According to the time of their arrival they raise two or even three broods in the season. The cat bird is not easily induced to forsake its nest. Wilson removed one containing four eggs, nearly hatched, from a grape vine into a thicket of briars close by, which was soon occupied by the female, as if nothing had happened to it. Other birds' eggs, those of the thrasher, and young of the same species, were instantly turned out of the nest in which they had been placed. Yet the male, divesting himself of selfish jealousy, observing the distress and helplessness of the young thus dislodged by his mate, began to feed them as his own. Their sagacity is therefore superior to that of the ordinary thrushes, as the *Turdus Wilsonii* is even one of the duped nurses occasionally employed by the cow bird.

The food of the cat bird is insects and worms, particularly beetles, and various garden fruits; feeding its young often on cherries, and other kinds of fruits. Sometimes they are observed to attack snakes when they approach the vicinity of their brood, and commonly succeed in driving off the enemy; when bitten, however, by the poisonous kinds, it is probable, as related, that they may act in such a manner, as to appear laboring under the influence of fascination. The cat bird, when raised from the nest, is easily domesticated, becomes a very amusing inmate, and seems attached to his cage, as to a dwelling or place of security. About dawn of day, if at large, he flirts about with affected wildness, repeatedly jerks his tail and wings with the noise almost of a whip, and stretching forth his head, opens his mouth and mews. Sometimes this curious cry is so gutteral as to be uttered without opening the bill. He often also gives a squeal as he flies from one place to another; and is very tame, though pugnacious to all other birds which approach him for injury. When wanting food, he stirs round with great uneasiness, jerks every thing about within his reach, and utters the feeble cry of the caged mocking bird. A very amusing individual, which I now describe, began his vocal powers by imitating the sweet and low warble of the song sparrow, as given in the autumn; and, from his love of imitation on other occasions, I am inclined to believe that he possesses no original note of his own, but acquires and modulates the songs of other birds. Like the robin, he is exceedingly fond of washing, and dashes about in the water till every feather appears drenched; he also, at

times, basks in the gravel in fine weather. His food, in confinement, is almost every thing vegetable, except unbruised seeds; as bread, fine pastry, cakes, scalded corn-meal, fruits, particularly those which are juicy, and now and then insects and minced flesh.

The length of this species is about nine inches. Above deep slate color, lightest on the edges of the primaries, and also considerably paler below. The under tail coverts reddish chesnut. Tail rounded. Upper part of the head, legs and bill, black. It occurs rarely pye-bald, with the head and back white, being nearly an albino. In a caged bird, I have also observed one or two of the tail feathers and primaries partly white on their inner webs. In the *young*, before the first moult, the rufous vent is paler, and the black of the head indistinct.—*Nuttall's Ornithology.*

DISSERTATION ON TOBACCO.

[A Dissertation on the Medical Properties and Injurious Effects of the Habitual use of Tobacco: read according to appointment, before the Medical Society of the county of Oneida, at their Semi-annual Meeting January 5, 1830. By A. McAllister M. D. Second Edition, Improved and enlarged, with an Introductory Preface, by Moses Stuart, Associate Professor of Sac. Lit. in the Theol. Inst. at Andover. Boston: Peirce & Parker, 1832.]

This work is accompanied with the following strong testimonial by Dr. Warren of this city, which cannot but secure it a wide circulation, and the attentive perusal of every man who values his health.

Dear Sir—In compliance with your request, I have read over the pamphlet of Dr. McAllister on the use of tobacco. Though my present occupations have prevented my doing it so carefully, as to entitle me to suggest any alteration or improvement.

The general tendency of the pamphlet is excellent: and I most cordially give my opinion in its favor: for I have often had occasion to observe the pernicious effects of the free use of tobacco. Many instances of dyspepsia have come under my notice, the origin of which was traced to the practice of *chewing;* and on the abandonment of the habit, the patients were restored to health. I have seen a number of cases of injury to the voice, from the introduction of *snuff* into the *facial sinuses.* As to *smoking*, I am well satisfied

that it is calculated to cause a feverish state of the body; and in certain constitutions it weakens the membranes which line the nostrils, throat and lungs, produces a susceptibility to colds, and even more serious affections of these parts, when it has been much employed.

From what I have seen, I have been led to believe that this article is not necessary nor useful for the preservation of health; and that it is often a cause of weakness and sickness.

Boston, Jan. 25, 1832. JOHN C. WARREN.

NOTE.—Many persons have the opinion that the use of tobacco is a preventative of contagious diseases; because it has been asserted that tobacconists and others living in the midst of the effluvia of this article, are exempted from the attacks of such disorders. The practices above alluded to have, in my opinion, a contrary effect. Those who live constantly in the region of tobacco, by the effect of habit cease to be stimulated and over excited by the diffusion of its lighter particles in the air they breath. But those who employ it occasionally, whether in smoking, chewing or snuffing, undergo an excitement, more or less considerable: which is infallibly followed by a proportionate debility, in which state they would be subject to the attacks of a disease they might otherwise have escaped. J. C. W.

In our next number we shall make an extract treating of the medical properties of tobacco, and the injurious effects attending its use, and of its political and moral influence.

MISCELLANEOUS INTELLIGENCE.

FELINE SAGACITY.

DE LA CROIX relates the following almost incredible instance of sagacity in a cat, which, even under the receiver of an air pump, discovered the means of escaping a death that appeared to all present inevitable. 'I once saw,' says he, 'a lecturer upon experimental philosophy place a cat under the glass receiver of an air pump, for the purpose of demonstrating that very certain fact, that life cannot be supported without air and respiration. The lecturer had already made several strokes with the piston, in order to exhaust the receiver of its air, when the animal, that had began to feel herself very uncomfortable in the rarified atmosphere, was fortunate

enough to discover the source from whence her uneasiness proceeded. She placed her paw upon the hole through which the air escaped, and thus prevented any more from passing out of the receiver. All the exertions of the officer were now unavailing; in vain he drew the piston; the cat's paw effectually prevented its operation. Hoping to effect his purpose, he let air again into the receiver, which, as soon as the cat perceived, she withdrew her paw from the aperture; but when he attempted to exhaust the receiver, she applied her paw as before. All the spectators clapped their hands in admiration of the wonderful sagacity of the animal, and the lecturer found himself under the necessity of liberating her, and substituting another in her place, that possessed less penetration, and enabled him to exhibit the cruel experiment.'

Economical Fuel.

A good fire, on a winter's day, at a mere trifling expense, is of importance to a poor man. One penny worth of tar or rosin water will saturate a tub of coal with triple its original quantity of bitumen, (the principle of heat and light,) and of course render one such tub of three times more value than it was when unsaturated.

A new Practice of Painting.

(*Communicated to the Royal Institution of Great Britain.*)

Mr. Robertson paints in water colors and upon paper. He uses isinglass, dissolved in hot spirits of wine, between and over his colors, by which they acquire the brilliancy and force of oil; and when the picture is finished, he covers it with a colorless copal varnish. The pictures, when large, are covered with canvass and tin foil. The durability and steadfastness of the colors appear to be extreme.

Lamp Glasses.

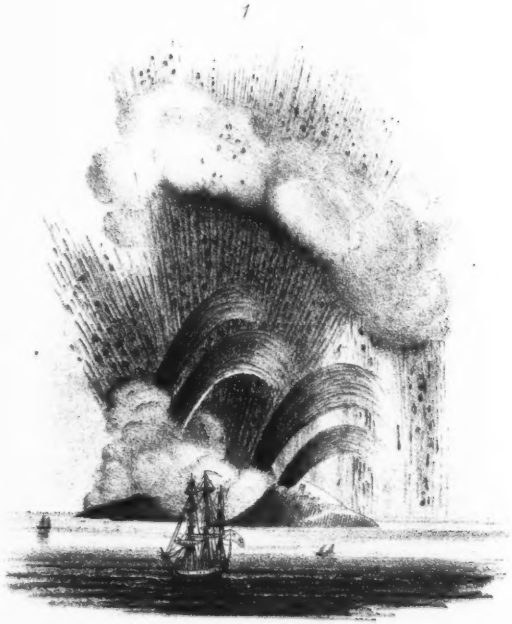
To prevent the cracking of lamp glasses, by a sudden expansion of heat; an effectual remedy is found in running a point of a diamond along the base of the tube. By this solution of continuity, it is relieved from the violence produced by the sudden effects of the heat. A glazier can best perform the operation with the diamond.—*Jour. de Connois. Usuelles.*

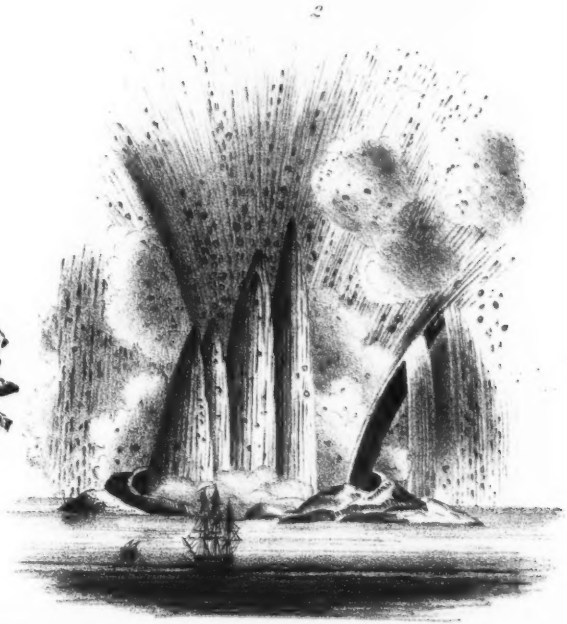
METEOROLOGICAL JOURNAL,

Kept at Boston, for January, 1832.

	THERMOMETER.			BAROMETER.			FACES OF THE SKY.			DIRECTION OF WINDS.			RAIN.
Day.	*Morn.*	*Noon.*	*Even.*	*Morn.*	*Noon.*	*Even.*	*Morn.*	*Noon.*	*Even.*	*Morn.*	*Noon.*	*Even.*	*Inch.*
1	13	24	14	29.86	29.90	29.91	Fair	Fair	Fair	N. W.	N. W.	N. W.	
2	5	21	14	30.10	30.12	30.16	Fair	Fair	Fair	N. W.	S. W.	S. W.	
3	23	32	19	29.96	29.90	30.05	Cloudy	Fair	Fair	S. E.	S. W.	N. W.	0.11
4	6	16	10	30.21	30.35	30.36	Fair	Fair	Fair	N. W.	N. W.	N. W.	
5	16	36	33	30.16	30.08	30.08	Fair	Cloudy	Cloudy	S. W.	S. W.	S. W.	
6	32	37	36	30.02	29.93	29.92	Rain	Rain	Rain	S. E.	S. W.	S. W.	
7	23	26	22	30.16	30.24	30.30	Fair	Fair	Fair	N. W.	N. W.	N. W.	0.50
8	13	24	35	30.30	30.24	29.88	Cloudy	Cloudy	Rain	N. W.	N.	N. E.	
9	37	40	32	29.18	29.44	29.72	Cloudy	Fair	Fair	S. W.	S. W.	N. W.	1.58
10	27	38	32	29.80	29.79	29.75	Fair	Cloudy	Cloudy	S. W.	S. W.	S. W.	
11	31	32	22	29.63	29.58	29.72	Snow	Cloudy	Fair	S. W.	S. W.	N. W.	0.24
12	15	20	17	29.80	29.98	30.02	Fair	Fair	Cloudy	N. W.	N. W.	S. W.	
13	21	37	30	30.08	29.99	30 10	Fair	Fair	Fair	S. W.	S. W.	S. W.	
14	20	34	28	30.25	30.30	30.35	Fair	Fair	Fair	N. W.	N. W.	N. W.	
15	28	42	35	30.32	30.31	30.30	Fair	Fair	Fair	S. W.	S. W.	S. W.	
16	31	47	37	30.30	30.30	30.33	Fair	Fair	Fair	S. W.	S. W.	S. W.	
17	24	48	45	30.32	30.30	30.16	Fair	Fair	Fair	N. W.	S. W.	S. W.	
18	44	50	48	30.08	30.00	29.85	Rain	Cloudy	Cloudy	S. W.	S. W.	S. W.	0.25
19	46	48	37	29.80	29.80	29.92	Fair	Fair	Fair	S. W.	S. W.	W.	
20	34	40	33	30.00	30.05	30.08	Cloudy	Fair	Fair	W.	N. W.	N. W.	0.28
21	31	33	24	29.93	29.90	30.10	Snow	Fair	Fair	W.	N. W.	N. W.	
22	18	24	16	29.18	30.30	30.40	Fair	Fair	Fair	N. W.	N. W.	N. W.	
23	10	27	26	30.42	30.42	30.42	Fair	Fair	Cloudy	N. W.	N. W.	S. W.	
24	28	38	34	30.28	30.18	30.10	Cloudy	Cloudy	Snow	S. E.	S. E.	E.	
25	46	38	18	29.80	29.72	29.87	Rain	Cloudy	Fair	S. W.	N. W.	N. W.	0.88
26	4	8	1	30.09	30.25	30.41	Fair	Fair	Fair	N. W.	N. W.	N. W.	0.47
27	—4	10	2	30.42	30.40	30.40	Fair	Cloudy	Fair	N. W.	N. W.	N. W.	
28	—2	16	15	30.40	30.41	30.41	Fair	Fair	Cloudy	N. W.	N. W.	S. W.	
29	19	24	31	30.38	30.35	30.32	Snow	Snow	Snow	N. E.	N. E.	N. E.	
30	35	36	35	30.20	30.05	29.82	Cloudy	Rain	Rain	N. E.	N. E.	N. E.	0.38
31	32	32	24	29.92	30.02	30.19	Fair	Fair	Fair	N. W.	N. W.	N. W.	0.03

Depth of water fallen, 4.72 inches.





RIVERSIDE INSTITUTE OF TECHNOLOGY

Pendleton's Lithog.ph Boston.

GRAHAM ISLAND.